AF/1714 IZW

MS APPEAL BRIEF - PATENTS
PATENT
0229-0657P

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of		Before the Board of Appeals	
Toru IIZUKA et al.		Appeal No.:	
Appl. No.:	09/940,467	Group:	1714
Filed:	August 29, 2001	Examiner:	K.I. WYROZENBSKI LEE
Conf.:	5043		
For:	PNEUMATIC TIRE		

APPEAL BRIEF TRANSMITTAL FORM

MS APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

December 22, 2004

Sir:

Transmitted herewith is an Appeal Brief on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on August 12, 2004.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27

The fee has been calculated as shown below:

☒ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - $1,020.00.

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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JAK/mlr
0229-0657P

Attachment(s)

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BRIEF ON BEHALF OF APPELLANTS

APPEAL BRIEF - PATENTS December 22, 2004
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is respectfully submitted on behalf of the Appellants in connection with the above-identified application.

This is an Appeal from the Final Rejection by the primary Examiner of Claims 1 and 5-8 in the above-identified application, which claims were finally rejected in the Office Action dated February 13, 2004. The appealed claims 1 and 5-8 are set forth in the attached Appendix.

I. REAL PARTY IN INTEREST

In accordance with 37 C.F.R. § 1.41.37(c)(1)(i), it is submitted that the real party in interest of the present application is SUMITOMO RUBBER INDUSTRIES, LTD. of Kobe-Shi, Hyogo-Ken, Japan by virtue of an Assignment recorded on November 29, 2001.

II. RELATED APPEALS AND INTERFERENCES

In accordance with 37 C.F.R. § 1.41.37 (c)(2)(ii), it is submitted that there are no other appeals or interferences known to Appellants, the undersigned, or the Assignees that will directly affect or be directly affected by or have a bearing on the Board's decision in the present appeal.

III. STATUS OF THE CLAIMS

Claims 2-4 are cancelled.

Claims 1 and 5-8 are rejected and appealed. Claims 1 and 5-8 are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

No Amendments have been filed subsequent to the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Method in General

The present invention is directed to a Pneumatic tire wherein the belt which is utilized therein comprises a ply of monofilament metallic cords which are rubberized with a topping of rubber, the topping of rubber including a rubber base, a methylene donor and a resorcinol or a resorcinol condensation product. Advantageously, the metallic chords may be waved either two-dimensionally or three-dimensionally as shown in Figs. 4A and 4B of the present application. As noted at the top of page 5 of the present application, when the chords 13 are waved either two-dimensionally or three-dimensionally, it is preferable that the wave pitches P are not less than 14.0 mm and the wave heights H are 0.002 to 0.02 times the wave pitches P. It has been found that if all of the chords of the two breaker plys are straight or unwaved, the rigidity or stiffness of the belt tends to increase excessively. Thus, although the steering stability might be improved, the resistance to fatigue, belt durability and ride comfort tends to deteriorate. In the case of waved, monofilament chords, on the other hand, although the steering stability may be adversely affected somewhat, this shortcoming is offset by a general improvement in performance with respect to resistance and fatigue, belt durability, ride comfort, and the like. The present invention is also concerned with a belt which is disposed radially outside of the carcass in the tread portion of the tire wherein the

belt includes a breaker which contains two cross plys, each made of monofilament chords wherein the monofilament chords in each of the two cross plys are laid parallel with each other at an angle of from 15° to 30° with respect to the tire circumferential direction at a chord count of from 15 to 60 (/5 cm). Thus, the Appellants have defined a pneumatic tire which exhibits an optimum balance of desired tire properties, such as steering stability, tire weight, resistance to fatigue, belt durability, ride comfort and the like. Examples 1 and 2 in table 1 in the preset application show the enhancement in the steering stability which represents such properties as steering response, steering rigidity, grip, and the like. Examples 1 and 2 clearly show an improvement in steering stability while, at the same time, achieving a tire weight reduction.

Independent Claim 1

Independent claim 1 defines a pneumatic tire which contains a belt which comprises a ply of monofilament metallic chords 13 rubberized with a topping rubber 12 (Fig. 2). The topping rubber includes 30 to 60 by weight of carbon black and 0.5 to 5.0 parts by weight by resorcinol and/or resorcinol condensation product(s) with respect to 100 parts by weight of the rubber base. The topping rubber also includes a methylene donor. A disclosure of the rubber base, the resorcinol and the resorcinol condensation product(s) and the methylene donor can be found on page 5, lines 15-25 of the

present application. Claim 1 further defines the monofilament chords in each of the two cross plys as being laid parallel with each other at an angle to 15° to 30° with respect to the tire circumferential direction at a chord count of from 15 to 60 (/5 cm).

Independent Claim 5

Independent claim 5 differs from independent claim 1 in its recitation that the monofilament magnetic chords are waved two-dimensionally at a wave pitch of not less than 14.0 mm and a wave height of from 0.002 to 0.02 times the wave pitch. Please see in this regard page 4, line 28 to page 5, line 3 of the present application.

Independent Claim 6

Independent claim 6 differs from independent claim 1 and independent claim 5 in reciting monofilament metallic chords that are waved three-dimensionally at a wave pitch of not less than 14.0 mm and a wave height of from 0.002 to 0.02 times the wave pitch. Please see in this regard page 4, line 28 to page 5, line 3 of the present application.

Dependent Claim 7

Dependent claim 7 recites that the diameter of the monofilament is in the range of from 0.39 to 0.44 when the pneumatic tire is a passenger car tire. Please see in this regard page 4, line 21 to line 25.

Dependent Claim 8

Claim 8 recites that the diameter of the monofilament chord is in the range of 0.44 to 0.70 when the pneumatic tire is a heavy duty radial tire. Please see in this regard page 4, lines 25-27 of the present application.

VI. GROUNDS OF REJECTION

Claims 1, and 4-8 stand rejected under 35 USC §103(a) as being unpatentable over Beers, U.S. Patent 6,120,911 in view of Nakano, U.S. Patent 5,804,002.

VII. APPELLANTS' ARGUMENTS

1. Beers et al. in view of Nakano

The Examiner relies on the Beers patent to disclose a composition for a wire coat which is utilized on metallic chords of a tire ply located in the belt area of the tire. The composition

of the wire coat comprises 100 parts of synthetic or natural rubber, 45 to 70 parts by weight of carbon black and adhesion promoters selected from methylene donors and acceptors. In methylene acceptors include phenols compounds such as resorcinol or its condensation products with aldehydes. The amount of the acceptor is in the range of 2.0 to 50 pbw (See column 5, line 48 to column 6, line 3). The methylene donor includes amine compounds such as melamines and their condensation products. The amount of the methylene donor in the composition of Beers is 2.0 to 5.0 pbw. The composition of Beers is utilized in metallic chords which have monofilaments having diameters of 0.08 to 0.5 mm. The Examiner acknowledges that the difference between the present invention and the Beers patent are the structural limitations of the monofilament chords to which such compositions can be applied, including the chord end count and the angle at which the monofilament chords are laid with respect to the circumferential direction of the tire.

The Examiner fills the deficiency of the Beer patent by relying upon the Nakano patent which shows in column 5, lines 13-16 chords which are disposed at an angel of 18° with a chord count of 23 or 28 chords per 5 cm (or 50 mm). Accordingly, the Examiner concludes that it would be obvious to one of ordinary skill in the art to utilize the composition of Beers which coats metallic filaments for a pneumatic tire to coat the specific metallic filaments disclosed in the Nakano patent, which are also utilized in pneumatic tires, to thereby obtain the claimed invention.

More specifically, the Beers et al. patent is directed to zinc-rich coated steel articles encapsulated by an outer layer of rubber and rubber composites containing such encapsulated articles. In the past, efforts have been made to use zinc-coated wires because of its tendency to be more corrosion-resistant. Unfortunately, such wires experienced insufficient adhesion properties to rubber in many composite applications, such as when used in conjunction with tires. Therefore, the Beers et al. patent is directed to improving the rubber to zinc-coated wire adhesion properties and thus focuses only on the composition of the rubber composites which are utilized to encapsulate the zinc-rich coated wires. Thus, clearly, the referenced patent is not concerned with providing a heavy duty pneumatic tire in which the rigidity of the tire is increase for improving the steering stability without increasing the cord diameter, the cord count, the tire weight, and the like. For this reason, the Beers et al. patent is not concerned with such features of the present invention as the use of a belt in a tire which includes a breaker which contains two cross plys each made of monofilament chords having specific diameters, the fact that the monofilament chords in each of the two cross plys are laid parallel with each other at an angel of 15° to 30° with respect to the circumferential direction and the use of a breaker ply having a chord count of from 15 to 60 (/5 cm) as recited in claim 1 of the present application.

The Examiner, recognizing the deficiencies of the Beers et al. patent has further relied on the Nakano patent in an attempt to

suggest the present invention. However, the Nakano patent is not concerned with the problems in the Beers et al. patent or the problems solved by the present invention, but is rather concerned with providing a tire which overcomes the disadvantage caused by the addition of a circumferential belt layer, that is belt separation, while strengthening circumferential rigidity by the addition of the circumferential belt layer. Accordingly, the Nakano patent focuses on the construction of the belt, whereby the coating rubber of the circumferential belt layer has a lower modulus of elasticity than that of the coating rubber of the inclined belt layer. Since the Nakano patent is not concerned with the importance of the rubber composition utilized in the present invention or utilized in the Beers et al. patent, it is the Appellants' position that one skilled in the art would not be lead to add the teaching of Nakano patent to that of the Beers et al. patent in an effort to suggest the present invention. Thus, there appears to be a complete lack of motivation as to why one skilled in the art would be lead to combine the references as suggested by the Examiner without making extensive use of the Appellants' own disclosure.

Independent claims 5 and 6 contain the subject matter of independent claim 1 and in addition recite that the monofilament chords are waved two-dimensionally or three-dimensionally at a specific wave pitch and a specific wave height. These features of the present invention are specifically discussed at the bottom of page 4 and the top of page 5 of the present application and shown

in Figs. 4A and 4B of the present application. As noted at the top of page 5 of the present application, when the chords 13 are waved either two-dimensionally or three-dimensionally, it is preferable that the wave pitches P are not less than 14.0 mm and the wave heights H are 0.002 to 0.02 times the wave pitches P. It has been found that if all the chords of the two breaker plys are straight or unwaved, the rigidity or stiffness of the belt tends to increase excessively. Thus, although the steering stability might be improved, the resistance to fatigue, belt durability and ride comfort tend to deteriorate. In the case of waved, monofilament chords, on the other hand, although the steering stability may be adversely affected somewhat, this short coming is offset by a general improvement in performance with respect to resistance to fatigue, belt durability, ride comfort and the like.

The Beers et al. patent does not disclose monofilament chords disposed in two cross plys laid parallel with each other at an angle of 15° to 30° with respect to the entire circumferential direction and a chord count of from 15 to 60 (/5 cm) as recited in claim 1 of the present application. With respect to claims 5 and 6, the Beers et al. patent does not disclose monofilament metallic chords having two and three-dimensional waves, let alone a wave pitch of not less than 14.0 mm and a wave height of from 0.002 to 0.02 times the wave pitch.

The Nakano patent does disclose the use of wavy cords or spirally wound cords. However, in the Nakano patent, the disclosed

layer in which straight or wavy monofilaments can be used is a circumferential belt layer and not the inclined belt layer utilized in the breaker of the present invention. Since the Nakano patent does not disclose the use of an inclined belt layer composed of a monofilament chords, the referenced patent does not teach the Appellants' claimed breaker.

Claim 7 recites a pneumatic tire where in the case of a passenger car tire, it is advantageous if the monofilament chord utilized in the tire has a diameter within the range of from 0.39 to 0.44 mm. In the case of a heavy duty radial tire, the diameter of the monofilament chord advantageously is in the range of 0.44 to 0.70 as recited in claim 8 of the present application. Since both claims 7 and 8 are dependent from claim 1, it is believed that claims 7 and 8 are also patentable for the same reasons as claim 1 is patentable.

The present invention has identified a pneumatic tire which utilizes a particular rubber composition in combination with a particular belt construction which is effective in providing a particular balance of components and properties for achieving a pneumatic tire with improved steering stability, reduced tire weight, resistance to fatigue, belt durability, ride comfort, and the like. These objectives were not part of the vision of either of the references relied upon by the Examiner and thus, to reject claims of the present application, it is necessary to reconstruct

the teachings of both of the references in view of the Appellants' own disclosure.

VIII. CONCLUSION

In view of the above remarks Appellants submit that the Examiner's Rejection is in error and Appellants request that the Examiner's rejection be reversed and the Application allowed.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: CLAIMS APPEALED APPENDIX
EVIDENCE APPENDIX
RELATED PROCEEDINGS APPENDIX

APPENDIX A

CLAIMS APPEALED APPENDIX

1. A pneumatic tire comprising

a carcass extending between bead portions through a tread portion and sidewall portions,

a belt disposed radially outside the carcass in the tread portion,

the belt comprising a ply of monofilament metallic cords rubberized with a topping rubber, and

the topping rubber including a rubber base, a methylene donor and at least one of resorcinol and resorcinol condensation products, wherein

the topping rubber includes 30 to 60 parts by weight of carbon black and 0.5 to 5.0 parts by weight of the resorcinol and/or resorcinol condensation product(s) with respect to 100 parts by weight of the rubber base,

the content in parts by weight of the methylene donor is in a range of 0.5 to 2.0 times the total content in parts by weight of the resorcinol and/or resorcinol condensation product(s),

said belt includes a breaker comprising two cross plies each made of monofilament cords having a diameter of from 0.35 to 0.70 mm,

the monofilament cords in each of said two cross plies are laid parallel with each other at an angle of from 15 to 30 degrees with respect to the tire circumferential direction at a cord count of from 15 to 60 (/5 cm).

CLAIMS 2-4 (CANCELLED)

5. A pneumatic tire comprising

a carcass extending between bead portions through a tread portion and sidewall portions,

a belt disposed radially outside the carcass in the tread portion,

said belt includes a breaker comprising two cross plies each made of monofilament metallic cords rubberized with a topping rubber,

the monofilament metallic cords in each of said two cross plies laid parallel with each other at an angle of from 15 to 30 degrees with respect to the tire circumferential direction at a cord count of from 15 to 60 (/5 cm),

the monofilament metallic cords having a diameter of from 0.35 to 0.70 mm and waved two-dimensionally at a wave pitch of not less than 14.0 mm and a wave height of from 0.002 to 0.02 times the wave pitch,

the topping rubber comprising 100 parts by weight of a rubber base, 30 to 60 parts by weight of carbon black, 0.5 to 5.0

parts by weight of at least one of resorcinol and resorcinol condensation products and a methylene donor, the content in parts by weight of the methylene donor being in a range of 0.5 to 2.0 times the total content in parts by weight of the resorcinol and/or resorcinol condensation product(s).

6. A pneumatic tire comprising

a carcass extending between bead portions through a tread portion and sidewall portions,

a belt disposed radially outside the carcass in the tread portion,

said belt includes a breaker comprising two cross plies each made of monofilament metallic cords rubberized with a topping rubber,

the monofilament metallic cords in each of said two cross plies laid parallel with each other at an angle of from 15 to 30 degrees with respect to the tire circumferential direction at a cord count of from 15 to 60 (/5 cm),

the monofilament metallic cords having a diameter of from 0.35 to 0.70 mm and waved three-dimensionally at a wave pitch of not less than 14.0 mm and a wave height of from 0.002 to 0.02 times the wave pitch,

the topping rubber comprising 100 parts by weight of a rubber base, 30 to 60 parts by weight of carbon black, 0.5 to 5.0 parts by weight of at least one of resorcinol and resorcinol

condensation products and a methylene donor, the content in parts by weight of the methylene donor being in a range of 0.5 to 2.0 times the total content in parts by weight of the resorcinol and/or resorcinol condensation product(s).

7. The pneumatic tire according to claim 1, wherein the diameter of the monofilament cord is in a range of from 0.39 to 0.44 mm, and the pneumatic tire is a passenger car tire.

8. The pneumatic tire according to claim 1, wherein the diameter of the monofilament cord is in a range of from 0.44 to 0.70 mm, and the pneumatic tire is a heavy duty radial tire.

APPENDIX B

EVIDENCE APPENDIX

None

APPENDIX C

RELATED PROCEEDINGS APPENDIX

None